

FORM PTO 1390 (REV. 5-98) US DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. §371		ATTORNEY DOCKET NUMBER 2001_0044A U.S. APPLICATION NO. 09/7762269
International Application No. PCT/JP00/06827	International Filing Date October 2, 2000	Priority Date Claimed
Title of Invention PORTABLE COMPUTER DEVICE		
Applicant(s) For DO/EO/US Takafumi YUASA et al.		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
<ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. §371. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. §371. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. §371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. §371(b) and PCT Articles 22 and 39(1). <input type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. §371(c)(2)) <ol style="list-style-type: none"> <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). ATTACHMENT A <input type="checkbox"/> has been transmitted by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US) <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. §371(c)(2)). ATTACHMENT B <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. §371(c)(3)). <ol style="list-style-type: none"> <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> have been transmitted by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. §371(c)(4)). <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. §371(c)(5)). 		
Items 11. to 14. below concern other document(s) or information included:		
<ol style="list-style-type: none"> <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. ATTACHMENT C <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. <input type="checkbox"/> A FIRST preliminary amendment. <ol style="list-style-type: none"> <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. <input checked="" type="checkbox"/> Other items or information: <ul style="list-style-type: none"> - <u>unexecuted</u> Declaration and Power of Attorney with Cover Letter - ATTACHMENT D 		
THE COMMISSIONER IS AUTHORIZED TO CHARGE ANY DEFICIENCY IN THE FEES FOR THIS PAPER TO DEPOSIT ACCOUNT NO. 23-0975		

U.S. APPLICATION NO. 09/762269		INTERNATIONAL APPLICATION NO. PCT/JPO/06827	ATTORNEY'S DOCKET NO. 2001_0044A																
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ENTER APPROPRIATE BASIC FEE AMOUNT = Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)). \$																			
<table border="1"> <thead> <tr> <th>Claims</th> <th>Number Filed</th> <th>Number Extra</th> <th>Rate</th> </tr> </thead> <tbody> <tr> <td>Total Claims</td> <td>5 - 20 =</td> <td>0</td> <td>X \$18.00</td> </tr> <tr> <td>Independent Claims</td> <td>1 - 3 =</td> <td>0</td> <td>X \$80.00</td> </tr> <tr> <td colspan="3">Multiple dependent claim(s) (if applicable)</td> <td>+ \$270.00</td> </tr> </tbody> </table>				Claims	Number Filed	Number Extra	Rate	Total Claims	5 - 20 =	0	X \$18.00	Independent Claims	1 - 3 =	0	X \$80.00	Multiple dependent claim(s) (if applicable)			+ \$270.00
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a. <input checked="" type="checkbox"/> A check in the amount of \$860.00 to cover the above fees is enclosed. A duplicate copy of this form is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. 23-0975 in the amount of \$_____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 23-0975.																			
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.																			
19. CORRESPONDENCE ADDRESS  000513 PATENT TRADEMARK OFFICE		By:  Charles R. Watts Registration No. 33,142 WENDEROTH, LIND & PONACK, L.L.P. 2033 "K" Street, N.W., Suite 800 Washington, D.C. 20006 Phone: (202) 721-8200 Fax: (202) 721-8250 February 6, 2001																	

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PCT/JP00/06827

DESCRIPTION

Portable Computer Device

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TECHNICAL FIELD

The present invention relates to a portable computer device including a notebook-sized personal computer.

BACKGROUND ART

10 A conventional portable computer device will be explained with reference to the perspective view shown in Fig. 3.

In Fig. 3, the portable computer device includes keyboard-equipped computer main unit 1, foldable display 2 made of a liquid crystal display (LCD), and loudspeaker units 5 disposed in space 6 in main unit 1.

15 Recently, a portable computer device has been getting smaller, lighter, and more powerful. It is not only used as a portable device, but also convenient for indoor use, due to its small footprint, instead of a desktop computer. The fact has driven up the demand for the portable computer device.

20 However, such a portable computer, for example, completely relies on small loudspeaker units 5 for its sound response, so that reproduction of low-audio frequencies is not in a satisfactory level. Therefore, in order to improve sound-response characteristics to a sufficient degree, a loudspeaker device with a built-in amplifier, which is similar to one employed for a desktop computer, is required to connect with the portable computer device.

25 As described in the example above, the portable computer device needs to connect another device therewith, such as peripheral devices employed for desktops, for its versatility. The fact inconveniently tends to impair the merit

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of the portable computer, that is, being compact.

DISCLOSURE OF THE INVENTION

The object of the present invention is to provide a portable computer
5 device, making the most of its advantages, i.e., compact size and high
performance.

The portable computer device of the present invention includes:

- 10 a display;
- a computer main unit;
- 10 a mounting section containing a terminal section to exchange signals
with the computer main unit, a locking section, which are disposed in the
computer main unit, and a space formed in the computer main unit; and
- 15 another device, which contains another terminal section to
exchange signals with the computer main unit by connecting with the terminal
section, detachably installed in the mounting section by the locking section.

This another device has another terminal section for exchanging signals
with the computer main unit through the connection with the terminal section
described above.

- 20 According to the portable computer device, another device required for
mobile-use and another device required for indoor-use are exchangeably
inserted in the space. With the structure, the portable computer device
satisfactorily delivers its advantage, i.e., being small and lightweight without
impairment of the capability, regardless of whether mobile-use or indoor-use.

25 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view illustrating a notebook-sized personal
computer and a detachable another device that are shown in an embodiment of

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the present invention.

Fig. 2 is a perspective view illustrating a personal computer and a plurality of detachable another devices that are shown in another embodiment.

Fig. 3 is a perspective view illustrating a notebook-sized personal computer as a type of prior art portable computers.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

First preferred embodiment

Hereinafter, the portable computer device of the embodiment of the present invention will be described with reference to the perspective view of the notebook-sized personal computer in Fig. 1, wherein the same parts are identified by the same reference numerals as ones in the notebook-sized personal computer in Fig.3, which is a type of conventional portable computer devices.

In Fig. 1, the portable computer device contains keyboard-equipped computer main unit 1a, foldable display 2 made of a liquid crystal display (LCD), and loudspeaker units 5 disposed in space 6 in main unit 1a.

Computer main unit 1a further comprises first mounting section 3a and second mounting section 3b.

The first mounting section 3a includes first terminal section 3d1 exchanging information with power supply and computer main unit 1a, and a locking section that detachably locks another device. For the locking section, a known locking mechanism, for example, press-fitting is employed (not shown.) First insertion section 3a has a space therein. The space is formed so that an I/O device including a floppy disk drive (not shown), and a rechargeable battery are installed in first mounting section 3a. Such an installed device has a first another terminal section (not shown), which exchanges information with power

supply or computer main unit 1a by connecting with terminal section 3d1.

Second mounting section 3b includes second terminal section 3d2 exchanging power supply with computer main unit 1a, and a locking section locking another device so as to be detachable. The locking section (not shown) 5 is formed as the same way as that of first mounting section 3a. Second mounting section 3b also has a space therein. The space is for accepting another device (not shown) having a second another terminal section (not shown), which exchanges information with power supply and computer main unit 1a by connecting with second terminal section 3d2.

10 Loudspeaker device 4, which is described as another device, contains an amplifier therein and port 4a for reproducing low-audio frequencies.

Loudspeaker device 4 is detachably installed in first mounting section 3a or second mounting section 3b. Through second terminal section 4b, loudspeaker device 4 is provided with power supply and sound information from 15 computer main unit 1a.

When installed in first mounting section 3a or second mounting section 3b of computer main unit 1a, loudspeaker device 4 activates by connecting second terminal section 4b with first terminal section 3d1 or second terminal section 3d2 and thereby receiving power supply and sound information from computer 20 main unit 1a.

In the embodiment, loudspeaker units 5 are installed in computer main unit 1a. Therefore, loudspeaker device 4 may be used for reproducing a low-pitched sound that cannot be covered by loudspeaker units 5.

Loudspeaker device 4 also may be used as a full-range speaker in such a 25 way that loudspeaker units 5 do not work while loudspeaker device 4 is installed in computer main unit 1a.

Besides, although loudspeaker device 4 has been described as having a

built-in amplifier in the explanation above, a loudspeaker having no amplifier may be acceptable if an adequately large output of sound information is provided from computer main unit 1a.

Although loudspeaker device 4 is described as a detachable device in the 5 embodiment, the detachable device is not limited to loudspeaker device 4. A battery or a hard disk device may also be a detachable device. Without increasing the bulk of the body, the portable computer can exert its functions regardless of whether mobile-use or table top-use, by installing the appropriate one selected in such devices as required.

10

Second Preferred Embodiment

Fig. 2 illustrates a notebook-sized personal computer in another embodiment of the present invention, wherein the same parts are identified by the same reference numerals as ones described in the first preferred 15 embodiment. In Fig. 2, the portable computer device comprises keyboard-equipped computer main unit 1b, foldable display 2 made of an LCD, and loudspeaker units 5 disposed in space 6 in main unit 1b.

Computer main unit 1b has mounting section 3c.

Mounting section 3c includes terminal section 3d exchanging information 20 with power supply and computer main unit 1b, and a locking section that detachably locks another device. For the locking section, a mechanism similar to that employed for first mounting section 3a in the first preferred embodiment can be used. Mounting section 3c has a space therein. The space is formed so that I/O device 7 including a floppy disk drive, and a rechargeable battery are 25 installed in mounting section 3c. Such an installed device has a first another terminal section 7a, which exchanges information with power supply and computer main unit 1b by connecting with terminal section 3d. Loudspeaker

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device 4 is detachably installed in mounting section 3c. Loudspeaker device 4 is provided with second terminal section 4b for receiving power and sound information from computer main unit 1b.

When carrying the notebook-sized personal computer having such a structure described above, a rechargeable battery (not shown) is installed in mounting section 3c. On the other hand, when the computer is used indoors and so on, i.e., commercial power is available, I/O device 7 such as a floppy disk drive, or loudspeaker device 4 can be installed in mounting section 3c.

In this way, the expandability as much as one equipped with a desktop computer is realized in the notebook-sized personal computer, taking full advantage of its small sized- and lightweight body.

In the figure and explanation of the embodiment, I/O device 7 and loudspeaker device 4, which are installed in mounting section 3c, have been described as having the similar size as mounting section 3c. However, I/O device 7 and loudspeaker device 4 may be smaller, or bigger than mounting section 3c. Such devices will be acceptable, in such a way that another terminal section to be a counterpart of terminal section 3d is disposed in another device, such as I/O device 7 and loudspeaker device 4, and the device is lockable by the locking section in mounting section 3c.

Besides, although loudspeaker device 4 is described as having port 4a in the two embodiments, other systems, such as a sealed speaker enclosure type system, a band-pass-box type system, an acoustic labyrinth type system, and a horn type system, are also acceptable.

25

INDUSTRIAL APPLICABILITY

As described above, the portable computer device of the present invention comprises a terminal section exchanging signals with the computer main unit, a

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locking section locking an installed another device, and an mounting section having a space formed in the computer main unit. Another device is detachably installed in the mounting section, so that the device required for mobile-use and the device required for indoor-use can be installed in the space in 5 the mounting section, replacing with each other as required. Regardless of indoor-use or outdoor-use, the portable computer device satisfactorily delivers its advantage, i.e., being small and lightweight without impairment of its performance.

In addition, in the case that a loudspeaker unit having an acoustic space 10 is installed as another device, the portable computer, when used indoors, employs the loudspeaker unit. Without an external add-on loudspeaker unit for reproducing low-audio frequencies, and without being bulky inconveniently for portables, the computer can reproduce low-pitched sound and obtain sound response having high quality acoustic characteristics.

15 Furthermore, in the case that a loudspeaker unit having an acoustic space and an amplifier is installed as another device above, when used indoors, without an external add-on loudspeaker unit for reproducing low-audio frequencies, the computer can reproduce low-pitched sound and obtain sound response having high quality acoustic characteristics, though it is a portable 20 computer.

Besides, in the case that a power supply terminal, which supplies power to an another device or a rechargeable battery, is disposed at the mounting section of the computer main unit, the computer can accept the devices required power supply for such as reading or writing information, such as a rechargeable 25 battery, a floppy disk drive, and a CD-ROM drive. The portable computer thus can make the most of its expandability, taking full advantage of its small sized-and lightweight body.

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Likewise, in the case that a plurality of terminals are disposed at the mounting section of the computer main unit so that power supply is delivered with each other between the plural terminals and a rechargeable battery having a relatively large volume, the mounting section can detachably accept a 5 loudspeaker unit, which has an acoustic space and a built-in amplifier, and another terminal that receives power and sound information from the computer main unit by connecting with the terminal section of the computer main unit.

In this case, the mounting section for the rechargeable battery with a 10 relatively large volume is used for the loudspeaker unit. Such an installation can realize the sound output with the frequency response, which is greatly improved in reproducing low-audio frequencies.

What is claimed is:

1. A portable computer device comprising:
 - a computer main unit;
 - a mounting section containing a terminal section that exchanges signals with the computer main unit, a locking section, which are disposed in the computer main unit, and a space formed in the computer main unit; and
 - a device, which contains another terminal section to exchange signals with the computer main unit by connecting with the terminal section, detachably locked in the mounting section by the locking section.
- 10 2. The portable computer device of claim 1, wherein said device is a loudspeaker unit that has an acoustic space and provided with power and sound information from the computer main unit by connecting the terminal section of the computer main unit with said another terminal section.
- 15 3. The portable computer device of claim 1, wherein said device is a loudspeaker unit that has an acoustic space and a built-in amplifier, and provided with power and sound information from the computer main unit by connecting the terminal section of the computer main unit with said another terminal section.
- 20 4. The portable computer device of claim 1, wherein the terminal section has a power supply terminal supplying power to at least one of said device and a rechargeable battery.

25

5. The portable computer device of claim 1, wherein a plurality of terminals are disposed at the terminal section so that power supply is delivered

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with each other between the plural terminals and a rechargeable battery, and said device detachably installed to the mounting section is a loudspeaker unit, which has an acoustic space and a built-in amplifier, has another terminal section for being provided with power and sound information from the computer

5 main unit by connecting with the terminal section,

Abstract

- A portable computer device that realizes its versatility, without impairment of its advantages, i.e., being small, lightweight and powerful. The portable computer device comprises terminal sections (3d1, 3d2) exchanging signals with computer main unit (1a), a locking section for locking another device to be installed, and mounting sections (3a, 3b) made of a space that accommodates the terminal sections and the locking section therein. According to the portable computer device, the device required for mobile-use and the device required for table top-use can be exchangeably installed in the space.
- 5
- 10 Therefore, the portable computer device exerts a greater expandability without impairment of its advantage.

FIG. 1

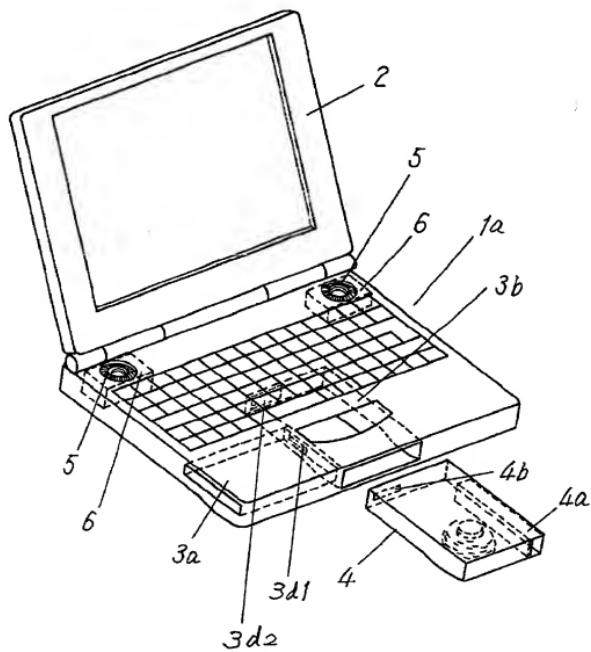


FIG. 2

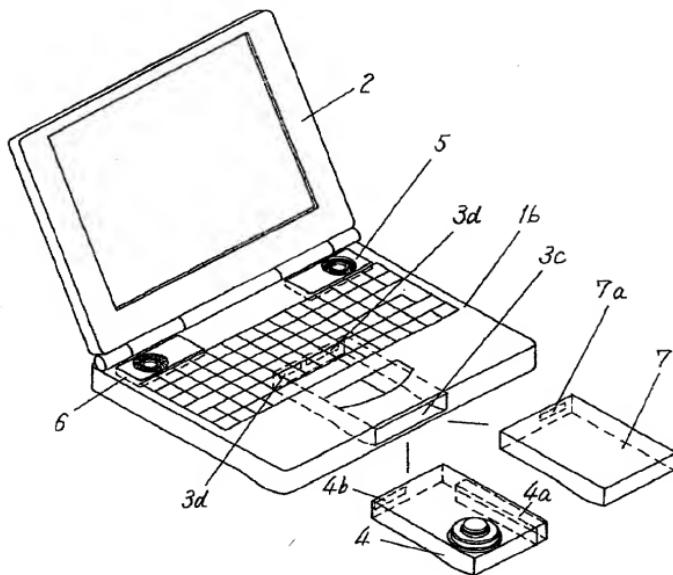
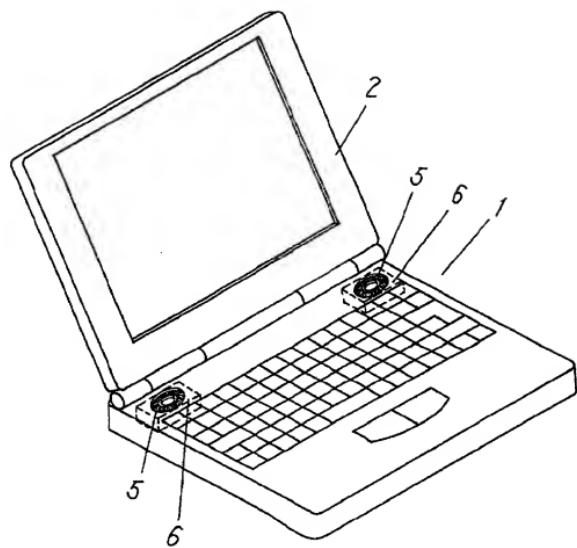


FIG. 3



Reference numerals in drawings

- 1 computer main unit
- 1a computer main unit
- 1b computer main unit
- 2 display
- 3a first mounting section
- 3b second mounting section
- 3c mounting section
- 3d terminal section
- 3d1 first terminal section
- 3d2 second terminal section
- 4 loudspeaker device
- 4a port
- 4b second terminal section
- 5 loudspeaker units
- 6 space
- 7 I/O device
- 7a another terminal section

DECLARATION AND POWER OF ATTORNEY FOR U.S. PATENT APPLICATION

Original Supplemental Substitute PCT DESIGN

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that I hereby believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Title: PORTABLE COMPUTER DEVICE

of which is described and claimed in:

the attached specification, or
 the specification in application Serial No. _____, filed _____, and with amendments
 through _____, or
 the specification in International Application No. PCT/JP00/06827, filed October 2, 2000, and as amended on _____
 (if applicable).

I hereby state that I have reviewed and understand the content of the above-identified specification, including the claims, as amended by any amendment(s) referred to above.

I acknowledge my duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim priority benefits under Title 35, United States Code, §119 (and §172 if this application is for a Design) of any application(s) for patent or inventor's certificate listed below and have also identified below any application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NO.	DATE OF FILING	PRIORITY CLAIMED
Japan	11-190378	July 5, 1999	NO

I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NO.	U.S. FILING DATE	STATUS: PATENTED, PENDING, ABANDONED

And I hereby appoint Michael R. Davis, Reg. No. 25,134; Matthew M. Jacob, Reg. No. 25,154; Warren M. Cheek, Jr., Reg. No. 33,367; Nils Pedersen, Reg. No. 33,145; Charles R. Watts, Reg. No. 33,142; and Michael S. Huppert, Reg. No. 40,268, who together constitute the firm of WENDEROTH, LIND & PONACK, L.L.P., as well as any other attorneys and agents associated with Customer No. 000513, to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected therewith.

I hereby authorize the U.S. attorneys and agents named herein to accept and follow instructions from Matsushita Electric Industrial Co., Ltd. as to any action to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. attorneys and myself. In the event of a change in the persons from whom instructions may be taken, the U.S. attorneys named herein will be so notified by me.

Direct Correspondence to Customer No:



000513

PATENT TRADEMARK OFFICE

Direct Telephone Calls to:

WENDEROTH, LIND & PONACK, L.L.P.
2033 "K" Street, N.W., Suite 800
Washington, D.C. 20006

Phone (202) 721-8200
Fax (202) 721-8250

Full Name of First Inventor	FAMILY NAME <u>YUASA</u>	FIRST GIVEN NAME <u>Takafumi</u>	SECOND GIVEN NAME
Residence & Citizenship	CITY <u>Mie</u>	STATE OR COUNTRY <u>JPX</u> Japan	COUNTRY OF CITIZENSHIP Japan
Post Office Address	ADDRESS 1711-3-212B, Uekawa-cho, Matsusaka-shi, Mie 515-0041	CITY Japan	STATE OR COUNTRY ZIP CODE
Full Name of Second Inventor	FAMILY NAME <u>HONDA</u>	FIRST GIVEN NAME <u>Kazuki</u>	SECOND GIVEN NAME
Residence & Citizenship	CITY <u>Mie</u>	STATE OR COUNTRY <u>JPX</u> Japan	COUNTRY OF CITIZENSHIP Japan
Post Office Address	ADDRESS 1849-111, Kubo-cho, Matsusaka-shi, Mie 515-0044	CITY Japan	STATE OR COUNTRY ZIP CODE
Full Name of Third Inventor	FAMILY NAME <u>DOI</u>	FIRST GIVEN NAME <u>Teruo</u>	SECOND GIVEN NAME
Residence & Citizenship	CITY <u>Mie</u>	STATE OR COUNTRY <u>JPX</u> Japan	COUNTRY OF CITIZENSHIP Japan
Post Office Address	ADDRESS 3522-2, Kobe-cho, Tsu-shi, Mie 514-0065	CITY Japan	STATE OR COUNTRY ZIP CODE
Full Name of Fourth Inventor	FAMILY NAME <u>YONEMOTO</u>	FIRST GIVEN NAME <u>Yukihiro</u>	SECOND GIVEN NAME
Residence & Citizenship	CITY <u>Mie</u>	STATE OR COUNTRY <u>JPX</u> Japan	COUNTRY OF CITIZENSHIP Japan
Post Office Address	ADDRESS 532-10, Shinden, Odai-cho, Taki-gun, Mie 519-2423	CITY Japan	STATE OR COUNTRY ZIP CODE
Full Name of Fifth Inventor	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
Residence & Citizenship	CITY	STATE OR COUNTRY	COUNTRY OF CITIZENSHIP
Post Office Address	ADDRESS	CITY	STATE OR COUNTRY ZIP CODE

Full Name of Sixth Inventor	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
Residence & Citizenship	CITY	STATE OR COUNTRY	COUNTRY OF CITIZENSHIP
Post Office Address	ADDRESS	CITY	STATE OR COUNTRY ZIP CODE

I further declare that all statements made herein of my own knowledge are true, and that all statements on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1st Inventor Takafumi Yusa Date March 28, 2001
 Takafumi YUASA

2nd Inventor Kazuki Honda Date March 28, 2001
 Kazuki HONDA

3rd Inventor Teruo Dai Date March 28, 2001
 Teruo DOI

4th Inventor Yukihiro Yonemoto Date March 28, 2001
 Yukihiro YONEMOTO

5th Inventor _____ Date _____

6th Inventor _____ Date _____

The above application may be more particularly identified as follows:

U.S. Application Serial No. 09/762,269 Filing Date February 6, 2001

Applicant Reference Number P23744-02(I.S.Teraoka) Atty Docket No. 2001_0044A

Title of Invention PORTABLE COMPUTER DEVICE